

## **TREE FELLING ASSEMBLY**

### **FIELD OF THE INVENTION**

**[0001]** The present invention relates to the field of tree removal, and with more particularity, to the cutting of delimbed tree trunks. With greater particularity, the present invention relates to a tree felling assembly and method of using the same for felling a tree trunk in a safe and controlled manner.

### **BACKGROUND OF THE INVENTION**

**[0002]** Tree removal work activities are widely regarded as dangerous, and should only be performed by highly skilled professionals. Most homeowners do not have the necessary equipment or requisite skill to remove a tree, and must resort to hiring a tree removal service, often at great expense. Of paramount importance in conducting removal activities is the safety of the workers performing the tree removal. Utilizing conventional tree felling techniques and equipment, however, even professional tree workers are at a high risk of serious injury during tree removal from falling branches.

**[0003]** In addition to worker safety, another significant concern in the tree removal business is preventing property damage during tree removal process. Utilizing conventional tree felling techniques and equipment, there is a high risk of a falling tree or falling portions thereof such as branches or tree trunk segments damaging property. This can include damage to a home, vehicles, power and utility lines, roads, and other trees. Additional hazards resulting from tree removal activities include damage to landscaping, fencing, and lighting structures adjacent to the

removed tree. As a result of these hazards, insurance rates for tree removal businesses are high as are the resulting fees for tree-removal services.

**[0004]** There are many instances in which it is necessary to remove a tree in a timely manner. For instance, a dead tree should be removed promptly, especially if it is in an area that can cause personal injury or property damage if it fell. Trees that suffer significant decay should likewise be removed. Additionally, it may be necessary to remove a tree that has critical structural defects such as cracks. Otherwise, such trees can fall in an uncontrolled and unpredictable manner such as during a severe storm. Unfortunately, the great expense associated with tree removal services, as well as the widely recognized hazards associated with tree removal activities, provide a disincentive to tree removal in a timely manner.

**[0005]** From the foregoing it may be seen that there is a significant need for improved devices and techniques for felling trees, to reduce the hazards and expense associated with tree removal. A need exists for a tree felling assembly and method of using that same that overcomes the limitations of the prior art and enables trees to be felled and handled in a controlled and safe manner.

#### SUMMARY OF THE PRESENT INVENTION

**[0006]** It is an object of the present invention to provide an improved assembly for use in felling trees.

**[0007]** Another object of the present invention is to provide a tree felling assembly that fells trees in a safe and controlled manner.

**[0008]** An additional object of the present invention is to provide a tree felling assembly that is simple and inexpensive to use and manufacture.

**[0009]** A further object of the present invention is to provide an assembly for felling a tree trunk in segments thereof, and for safely lowering the removed segments from the trunk in a controlled manner to minimize the possibility of property damage in the proximity of the tree trunk.

**[0010]** Another object of the present invention is to provide an improved method for felling a tree in a safe and controlled manner.

**[0011]** A still further object of the present invention is to provide a method of felling a tree trunk in segments thereof and selectively lowering the segment to a drop zone.

**[0012]** A further object of the present invention is to provide a method of felling a tree trunk that produces trunk segments that are long enough to be sawn for lumber as opposed to merely trash or firewood.

**[0013]** These and other objects of the present invention are accomplished through the use of a tree felling assembly comprising a vertical support structure having an elongated base portion, an elongated mast portion connected to the base portion and having at least a portion extending upwardly therefrom, and a horizontal lip extending from the base or integrally formed therewith for contacting engagement with a conventional notch formed in the trunk. The lip provides vertical support for the tree felling assembly during the process of cutting a segment from the trunk and

selectively lowering the segment to a drop zone. This significantly enhances the stability and safety of the present invention during use.

**[0014]** The tree felling assembly further comprises a top eyelet connected to or integrally formed with the back surface of the mast proximate its distal end, and a first pulley block connected thereto. The tree felling assembly further comprises a back eyelet positioned on or integrally formed with the back surface of the vertical support structure. A lowering eyelet is positioned on or integrally formed with the forward surface of the mast proximate the lip. The tree felling assembly further comprises a take-away cable operatively connected to the vertical support structure and extending generally downward therefrom to the ground below.

**[0015]** The take-away cable is used to lower and guide segments that have been cut from the tree trunk in a controlled manner. More specifically, during use of the tree felling assembly, a portion of the take-away cable is positioned above a drop zone onto which the segment is placed after being removed from the trunk. The drop zone may be the bed of a truck, allowing removed segments to be taken directly from the tree trunk onto means for transporting the segments from the worksite without additional on-site cutting or loading activities. Alternatively, the drop zone may be at grade in an optimum location where the removed segments may be stored or further processed. It can be appreciated that the present invention allows for felling a tree trunk in a controlled manner without causing damage to adjacent structures.

**[0016]** These and other objects and advantages of the invention will become apparent from the following detailed description of the preferred embodiment of the invention.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

**[0017]** A tree felling assembly embodying the features of the present invention is depicted in the accompanying drawings which form a portion of this disclosure and wherein:

**[0018]** FIG. 1 is a first perspective view of the preferred embodiment of a tree felling assembly;

**[0019]** FIG. 2 is a second perspective view of the preferred embodiment of a tree felling assembly;

**[0020]** FIG. 3 is front elevational view of the preferred embodiment of a tree felling assembly;

**[0021]** FIG. 4 is a rear elevational view of the preferred embodiment of a tree felling assembly;

**[0022]** FIG. 5 is a right side elevational view of the preferred embodiment of a tree felling assembly;

**[0023]** FIG. 6 is a top plan view of the preferred embodiment of tree felling assembly;

**[0024]** FIG. 7A is a perspective view of the preferred embodiment of a tree felling assembly secured to a tree trunk prior to cutting a segment therefrom;

**[0025]** FIG. 7B is a perspective view of the preferred embodiment of a tree felling assembly secured to a tree trunk prior to cutting a segment therefrom;

**[0026]** FIG. 8 is a perspective view of the preferred embodiment of a tree felling assembly during repositioning of the assembly along a tree trunk;

**[0027]** FIG. 9 is a perspective view of the preferred embodiment of a tree felling assembly during lowering of a tree trunk segment along a take-away cable operatively engaging the assembly; and

**[0028]** FIG. 10 is a perspective view of a second embodiment of a tree felling assembly during lowering of a tree trunk segment along a take-away cable operatively engaging the assembly.

#### DESCRIPTION OF THE PREFERRED EMBODIMENT

**[0029]** The present invention provides a tree felling assembly **10** for use in felling a tree trunk **11** in a safe and controlled manner. The assembly **10** provides for felling a tree trunk **11** in segments **11a** thereof, and for safely lowering the removed segments from the trunk **11** in a controlled manner, thereby minimizing the possibility of property damage in the proximity of the tree trunk **11**. Referring to Figures 1 – 10 for a clearer understanding of the invention, it may be seen that the preferred embodiment of the tree felling assembly **10** comprises a vertical support structure having an elongated base portion **12**, an elongated mast portion **14** connected to the

base portion **12** and having at least a portion extending upwardly therefrom, and a horizontal lip **16** extending from the base **12** or integrally formed therewith for contacting engagement with a conventional notch **18** formed in the trunk **11**. The present invention is utilized to fell a tree trunk **11** that has been delimbed.

**[0030]** The lip **16** is connected to or integrally formed with the base **12** and projects forward therefrom, as shown in Figure 5. The lip **16** has a bottom surface (not shown) for contacting engagement with at least a portion of a lower surface **18a** of the notch. As shown in Figures 7A and 7B, the lip **16** is sized to rest within the notch **18** when the assembly is in position for use. In this manner, the lip **16** provides vertical support for the tree felling assembly **10** during the process of cutting a segment **11a** from the trunk and selectively lowering the segment **11a** to a drop zone **42**. In addition to a base **12**, mast **14**, and lip **16**, the present invention further comprises means for securing the base **12** to the trunk **11**. Because the lip **16** of the present invention provides vertical support for the assembly, the means for securing the base **12** to the trunk **11** is thereby relieved from carrying the vertical load. This significantly enhances the stability and safety of the present invention during use. The assembly **10** provides a safe method of felling a tree trunk **11** in a controlled manner. In the preferred embodiment, the means for securing comprises at least one chain binder **20** connected at opposite ends thereof to the base **12**. It is contemplated that the present invention may utilize other such means for securing the base **12** to the trunk **11** as are well known in the art. In the preferred embodiment, the chain binders **20** further comprise means for tightening, namely,

chain clamp assemblies **20a**, that allow the base **12** to be readily secured to the tree trunk **11** after it has been properly positioned.

**[0031]** In the preferred embodiment, as shown in Figures 1 and 6, the base **12** is comprised of an elongated, rigid I-beam having an upper surface **12a**, a front surface **12b**, and a back surface **12c**. The lip **16** is positioned on the upper surface **12a** of the base and has a portion extending forward of the front surface **12b** of the base. The lip has a lower surface (not shown), a portion of which is in contacting engagement with lower surface **18a** of a conventional notch **18** when the assembly is secured to a tree trunk **11**. When the vertical support structure is secured to the trunk **11**, a portion of the front surface **12b** of the base is in contacting engagement with the trunk **11**. The base **12** of the preferred embodiment of the tree felling assembly **10** additionally has a storage compartment **22** for use in storing various tools and accessories, such as but not limited to hammers, ropes, pulley blocks, and eye bolts during use of the tree feller **10**. The storage compartment **22** has an open top and is formed by the lower portion of the back surface **12c** of the base with a bottom element **22a** and side element **22b** connected thereto. The storage compartment **22** may be utilized with an open top because the tree felling assembly **10** of the present invention maintains a generally vertical orientation during use, as further described below. The tree felling assembly **10** further comprises a snubbing ring **24** affixed to the base **12**, as shown in Figures 1, 3, and 4, around which one or more ropes may be looped for purposes of securing or for manually controlling the rate at which the rope may be upwardly fed as the segment **11a** is lowered.



**[0032]** In the preferred embodiment, as shown in Figures 2 and 6, the mast **14** is comprised of an elongated, rigid I-beam generally smaller in proportion to the base **12**, connected at its proximal end **14a** to the base **12**. The vertical support structure of the present invention is formed by the back surface **14c** of the mast and the back surface **12c** of the base, as shown in Figures 2 and 4. The tree felling assembly **10** further comprises a top eyelet **26** connected to or integrally formed with the back surface **14c** of the mast **14** proximate its distal end, as shown in Figures 2 and 5, and a first pulley block **32** such as but not limited to a snatch block connected thereto. The tree felling assembly **10** further comprises a back eyelet **28**, shown in Figures 2 and 5, positioned on or integrally formed with the back surface of the vertical support structure. As shown in Figures 1 and 5, a lowering eyelet **30** is positioned on or integrally formed with the forward surface **14b** of the mast proximate the lip **16**.

**[0033]** The tree felling assembly **10** comprises a take-away cable **40** operatively connected to the vertical support structure and extending generally downward therefrom to the ground below. The take-away cable **40** is used to lower and guide segments **11a** that have been cut from the tree trunk **11** in a controlled manner. More specifically, during use of the tree felling assembly **10**, a portion of the take-away cable **40** is positioned above a drop zone **42** onto which the segment **11a** is placed after being removed from the trunk. The drop zone **42** may be the bed of a truck, allowing removed segments **11a** to be taken directly from the tree trunk **11** onto means for transporting the segments **11a** from the worksite without additional on-site cutting or loading activities. Alternatively, the drop zone **42** may be at grade in an optimum location where the removed segments **11a** may be stored or further

processed. It can be appreciated that the present invention allows for felling a tree trunk **11** in a controlled manner without causing damage to adjacent structures.

**[0034]** The present invention further comprises a take-away pulley block **36** operatively engaging the take-away cable **40**. In the preferred embodiment, as shown in Figure 9, the take-away cable **40** operatively engages a second pulley block **34** connected to the back eyelet **28** and the first pulley block **32**. In this embodiment, the upper end **40a** of the take-away cable is connected to the take-away pulley block **36**. In a second embodiment of the present invention, as shown on Figure 10, the take-away cable **40** may be connected at its upper end **40a** to the back eyelet **28**. In both embodiments, the take-away cable **40** extends generally downwardly from the vertical support structure proximate the back eyelet **28** or second pulley block **34** to the drop zone **42**. In both embodiments, the lower end of the take-away cable **40** may be operatively connected to a winch **41** or other means of tightening or feeding the take-away cable **40**. The pulley blocks **32**, **34**, **36** may be connected to eyelets by connecting means well known in the art such as but not limited to connectors **38** such as shackles and snap rings.

**[0035]** The present invention comprises a method of progressively felling a tree trunk in segments, as described with reference to Figures 7 - 10. The tree felling method comprises positioning a tree felling assembly **10** along the trunk **11**, the assembly having a base **12**, horizontal lip **16** connected to the base **12** and projecting forward therefrom, and a mast **14** connected to the base **12** and having at least a portion extending upwardly from the base **12**. This positioning step may occur during

initial use of the tree felling assembly **10** prior to the removal of an uppermost segment of the trunk **11**, or any subsequently removed segment **11a**. The method further comprises the step of cutting a conventional notch **18** in the trunk **11** below the assembly **10**, the notch **18** having a lower surface **18a**.

**[0036]** The assembly **10** is then repositioned along the trunk **11** so that the lip **16** is in contacting engagement with at least a portion of the lower surface **18a** of the notch. As shown in Figures 7A and 7B, the assembly **10** is then secured to the trunk below the segment **11a**. The segment **11a** is then cut from the trunk and lowered therefrom by and along a take-away cable **40** operatively engaging the assembly **10**. The take-away cable **40** may be connected at its lower end to a winch **41** or other device utilized for taking slack out of the line. A portion of the take-away cable **40** is positioned above drop zone **42**, and the segment **11a** may then be selectively disengaged from the take-away cable **40** at the drop zone **42**.

**[0037]** In the preferred embodiment, as shown in Figure 9, the tree felling method further comprises the steps of affixing the upper end **40a** of a take-away cable **40** to the segment **11a**, and the step of engaging the take-away cable **40** with a first pulley block **32** connected to the mast **14** proximate a distal end thereof, and with a second pulley block **34** connected to a back surface of the assembly **10** prior to the cutting step. In the preferred embodiment, the method may further include the steps of attaching the segment **11a** to the take-away pulley block **36** operatively engaging the take-away cable **40** prior to the lowering step. In this method, concomitant with the lowering step may be the step of selectively feeding the take-away cable **40** from the